time they may be submitted to the public, as we wish they may be.

In conclusion, we may remark that, with the exception of a few descriptions of personal symptoms, which would have been much better left out, Mr. Andersson's "Notes on Travel in South Africa" forms an interesting and instructive volume to the general reader, as well as the student of geographical and natural science.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*]

A New Cetacean from New Zealand

I HAVE just received from Dr. Julius Von Haast of Canterbury, New Zealand, for presentation to the Zoological Society, an account of what appears to be a new species of Ziphioid Whale.

As far as can be at present ascertained, for, unfortunately, the heads only of three individuals, and these not in a perfect state, were obtained, it is nearly allied to the genus *Mesoplodon*, Gervais, but differs from the known species in the possession of a row of small pointed, conical, recurved teeth, about twenty in number, in the hinder part of the upper jaw, in addition to the usual single large tooth, placed near the middle of the ramus of the mandible. This is a very interesting circumstance as connecting the peculiar dentition of the ziphioids with that of the ordinary dolphins.

Another fact, new in the history of the Cetacea of this group, is that they belonged to a shoal of twenty-eight, all stranded together on one of the Chatham Islands, whereas all previously recorded examples have been either solitary or in pairs. It is evident that the attention which the naturalists of New Zealand are paying to the Cetacea, will throw much light on the history of the order, and it is to be hoped that they will persevere in collecting and preserving every specimen which may come within their reach. Dr. Haast's paper will be read at the next meeting of the Zoological Society. W. H. FLOWER

Evidences of Ancient Glaciers in Central France

MY attention has been recently called to a communication on the above subject which appeared in NATURE, vol. xiii. p. 31, from Dr. Hooker. Not having myself observed any traces of glacial action in the Mont Dore, and finding that M. l'Abbé Lecoq, whose examination of every portion of the district was most painstaking and exhaustive, has declared his conviction that no such traces exist, may I be permitted to remark that the evidence produced by Dr. Hooker does not appear very conclusive on the question? It consists of the occurrence of some large fragments of trachyte in the floor of the valley in which the Dordogne takes its rise, "the head of which occupies a noble amphitheatre immediately under the highest summit of Mont Dore," which "seen from a height above, were presumably huts, haystacks, *or glacially transported blocks*." The next day the doctor descended into the valley for a fuller examination of these blocks, and found himself "amongst a group of magnificent boulders *that had evidently been deposited* (?) *by an ancient glacier* which had flowed from the rocky amphitheatre at the head of the valley;" "others were seen further down the valley, its stream meandering among the blocks."

Now this description together with all that follows, and which I need not quote, strongly reminded me of a large assemblage of *débris* of trachytic rocks which on my last visit to the Mont Dore in 1860, I observed exactly in the position indicated by Dr. Hooker in the valley of the Dordogne, and which had been the result of a prodigious landslip or fall of a huge slice of the cliffs above, nearly a thousand feet high, forming the left flank of the valley as we look up it extending for upwards of half a mile. This landslip had occurred, if I remember rightly, in the previous winter, and was by no means an unprecedented occurrence, as the ruins of several older "eboulements" along the same line of cliffs attested. The summit of the cliffs consisted of a solid bed of trachyte perhaps fifty feet in thickness, and the action of frost on the waters infiltrated into the vertical joints of this rock tended to detach occasionally blocks of it which in large numbers, and many of them of enormous size, had evidently fallen from above on the floor of the valley. Some of these bore exactly the appearance of those described and figured by Dr. Hooker, and with every deference to his high authority, I cannot but suspect that they are the identical rocks which he, somewhat hastily, perhaps, concluded could only have been transported by "an ancient glacier descending from the neighbouring head of the valley." Should this prove to be the case, as no other evidence of the action of glaciers in the Mont Dore has been produced, it is presumable that M. Lecoq's view is correct, that none such are to be found. G. POULETT SCROPE

Fairlawn, Cobham, Surrey

Science Classes and Penny Lectures in Birmingham

IN NATURE, vol. xiii., p. 82, is an article on "The Manchester Science Lectures," in which it is stated that the popular lectures at the Midland Institute Birmingham "are chiefly frequented by the middle classes," while "at the Manchester lectures the class of persons present was chiefly working men for whom the lectures were designed.

This statement, although not absolutely incorrect, conveys quite a false impression respecting the Birmingham lectures; the fact being that the Midland Institute has two Departments, the "General" and the "Industrial," the former being designed for the middle classes, and the latter for artisans, &c. As the history of the popular scientific teaching at this Institute includes some instructive practical experience, a few reminiscences of the leading facts may be interesting.

The Institute commenced its working existence in October 1854 with three classes, one for Physics meeting on two evenings per week, one for Chemistry also on two evenings per week, and one on Popular Physiology and the Laws of Health meeting on one evening per week. These were all conducted by myself—then the only teacher of the Institute—at the rooms of the old Philosophical Institution, 7, Cannon Street. They were attended by men and boys, for the most part artisans and *bonâ fide* students. The first course on Chemistry comprised about 90 lectures, that on Physics about 130, and that on Physiology about 30 lectures.

The number of students and the general success of these lectures exceeded the expectations of the promoters of the Institute, and refuted the predictions of the large proportion of influential Birmingham men who loudly expressed their anticipations of failure.

Such was the beginning, but ere long we were threatened with a repetition of the old experience of the old Mechanics' Institution, and other similar efforts that had failed in Birmingham, and upon which failures these gloomy predictions were founded. The Chemistry class, which was the largest at first, sustained its numbers and attendance during what I may call the combustive stage of its existence, that is, so long as the three oft-quoted essentials of successful chemical lectures "the flash, the bang, and the stink," were maintained; but when we came to the metals, to mere precipitates, equations, analysis, &c., the numbers seriously declined.

The Physics class, which began more modestly, kept up its numbers rather better; there, the progress was from the heavy business of statics and dynamics, to the more wonderful phenomena of heat, light, and electricity. The physiology class was the smallest from the first, but held on pretty steadily to the end of the course.

On completing the first course of each subject we encountered a check that threatened our very existence. The numbers diminished, and this diminution became alarming with the third course on Physiology (which commenced before that of the other subjects). The alarming element was not merely the diminishing number of students, but the obvious cause of this diminution. We were evidently exhausting our raw material. The total number of Birmingham artisans who desired the amount of scientific instruction we offered them was but limited, and the majority of these had attended the first courses, and in the ordinary progress of normal generation they were not reproducible with a rapidity at all corresponding to the repetition of our courses of instruction. What was to be done?

This difficulty of course presented itself more forcibly to me than to anybody else as the facts were more directly before my eyes, and naturally led to serious reflections. To have shortened the courses of instruction, to have made them lighter and more popular, would have sacrificed our main object, seeing that I had already gone as far in that direction as sound instruction permitted. What then?

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My own early experience suggested a solution. Might I not deliver some well advertised public scientific lectures of a sufficiently light and sensational character to captivate the intellect by the natural bait of wonderment? If so, the systematic classes might be fed by their means.

My first idea was, considering the poverty of the Institute at that time, to charge twopence or threepence for admission to such lectures, but on communicating my scheme to Mr. Arthur Ryland, the Vice-President of the Institute, he improved it materially by suggesting that the charge for such lectures should be one penny, and that they should be called "Penny Lectures." The Council assented to this, and on Jan. 22, 1856, I commenced the first course of Twelve Penny Lectures in the Lecture Theatre, Cannon Street.

The lecture theatre was crowded throughout the course, which served its intended purpose of supplying an outline of the grasp of Physical Science. This course was followed by others. I continued them every Tuesday evening during above nine months of each year until July 1863, when I left Birmingham. They were always well attended but with some degree of fluctuation. The smallest attendance was during a course on the Birmingham manufactures, and the best attendance when subjects connected with combustion, electricity, or my own travelling experiences were treated and well illustrated.

I do not at all presume to describe these lectures as nearly equal to the Manchester lectures that have been lately delivered. They were necessarily extemporised, as may be supposed from the fact that, with the exception of an occasional volunteer (four or five lectures per annum), I delivered them all myself, and at the same time conducted the Lectures on Chemistry, Experimental Physics, Junior and Ladies' Classes, and the Practical Analytical Class in the Laboratory, besides being compelled to supplement my very small salary by writing newspaper articles.

I mention this to show how much may be done by small means. The Institute was so poor at its beginning that I was obliged to fit the lectures to the small stock of apparatus we possessed, and lecture on whatever subjects I could best illustrate. The average outlay upon illustrating these early lectures did not exceed three or four shillings each.

Nevertheless their object was fulfilled. The Penny Lectures fed the Science Classes, which without such aliment would have been starved and extinguished in their infancy. Their success led to the establishment of the "Penny Readings" of the Midland Institute in 1857 or 1858, which were, I believe, the first of these entertainments that have since become so popular and so much degenerated. These again were followed by the Penny Arithmetic Classes and the other Penny Classes which have since formed one of the leading and most important features of good work done and doing in Birmingham.

The egotism of the above narrative will possibly be pardoned, seeing that the experiences of the early struggles of the Science Classes of the Midland Institute have been so often repeated where similar efforts have been made, and are likely to be continued so long as the prevailing inefficiency or total absence of scientific instruction in our primary schools remains. The success of these Penny Lectures, in spite of all their shortcomings, in creating a demand for more thorough instruction indicates an available means of rendering science classes successful in other places. My advice to all concerned in the promotion of such classes is that they should make no compromise in reference to the classes themselves, by attempting to bring *in them* the subjects down to the level of present requirements of the majority, but that instead of this, they should, by means of very popular, attractive, aye, even sensational public penny lectures, excite curiosity, and create an interest in science among those they desire ultimately to teach.

Being now in the confessional I may as well admit that I practised several small illegitimate devices to keep my audiences together, one especially copied from the young lady who occupied "the thousand and one nights," that of leading the subject up to some amusing experiment just at the end of the lecture, and then discovering that it was time to conclude, and therefore that the experiment must be shown next Tuesday. The small boys who occupied the front seats and applauded all the explosions soon found me out, but they came next week nevertheless, and some of these who at first were blue-fire pupils only, ultimately joined the classes and became satisfactory students. Therefore the Penny Lecturer should not be too rigidly regardful of his own scientific dignity, but Barnumise to some extent, when he can thereby advance towards the high object he seeks to attain.

"Should this meet the eye" of any disconsolate projector and manager of a failing Mechanics' Institution or similar effort, let him try Penny Lectures forthwith, not musical or dramatic lectures, but lectures on the most wonderful of natural phenomena, including as much scientific explanation as the audience can digest, and at the same time let him prepare to supply the solid class instruction for which such lectures should ultimately create a demand. W. MATTIEU WILLIAMS

Belmont, Twickenham

Proposed Optical Barometer

I WAS led the other day to consider the possible effect of changes of barometric pressure on the ultimate destination of light passing through lighthouse refracting agents, and although I was satisfied that such changes cannot produce any effects of practical importance, the idea occurred to me that a glass prism might be used as a barometer. When a refracting prism is successively immersed in media of different refractive indices the ultimate angular deviation of the ray will, as is well known, depend in each case on the relative indices of the glass and the medium surrounding it at the time of the experiment. And as the refractive index of atmospheric air varies with its density, the amount of deviation of the refracted ray will be a measure of the density of the air, *i.e.* will give the means of ascertaining the reading of the barometer at the time.

If the ray of light were made to pass through a number of refracting and totally reflecting prisms the deviation would be increased. If with these prisms a microscope were combined the prisms might be used as a barometer. Or if the ray be received obliquely on a number of pieces of glass having parallel faces and slightly separated from each other, although there would be no angular deviation there would be horizontal displacement which would admit of being measured by a micrometer. How far such an application would be of practical value is certainly doubtful, as the effects of changes of temperature on the prism itself might interfere with the very limited range of the instrument. Or again, it is possible that easterly, westerly, or other currents—or perhaps differences in the hygrometric state of the atmosphere—may affect the index of refraction otherwise than by the mere changes of density which they produce. But if such be the case, the refracting prism will be useful in determining the existence and amount of such variations in the refrangibility of the atmosphere.

Edinburgh, Dec. 13 THOMAS STEVENSON

Seasonal Colour in Flowers

THE "blue of the wild hyacinth" (see vol. xiii. p. 129) is anticipated by the yellow of the primrose, the daffodil, the marsh marigold, the coltsfoot, the lesser celandine (*Ranunculus Ficaria*), and especially the winter aconite. We may add as contemporaries the buttercup, the yellow deadnettle, and the cowslip. The furze blooms in autumn and winter, and the golden broom in spring; the dandelion and the groundsel flower during the greater part of the year. The "deep scarlet of our summer flowers," represented in Britain by the poppies and the pimpernel only, is accompanied by the no less vivid blue of the cornflower, the wild chicory, the viper's bugloss (*Echium*), whose blossoms change from red to blue as they approach maturity, the flax, and the various campanulas. I say nothing of white flowers; but it is worth notice that the hepatica, bugle (*Ajuga*), and milkwort (*Polygala*), vary to almost precisely the same shades of blue, white, and pink, at quite different seasons. R. A. PRYOR

Hatfield, Dec. 17

Glands of the Cherry Laurel

THE nectariferous glands on the back of the leaf of the cherry laurel (vol. xiii. p. 107) are present also, I believe, in all the Drupaceæ. The position is not in all cases the same; but when the glands are not found on the back of the leaf, they may be seen on the petiole. Ants may often be found drinking this leaf-honey; and I heard, two or three years ago, that the same attraction had brought many hive-bees to the laurels in a garden at Sidmouth. E. H.

OUR ASTRONOMICAL COLUMN

VARIABLE STARS.—Nos. 2065-67 of the "Astronomische Nachrichten" contain another of Prof. Schönfeld's

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